AUTOMATED SMART HANGER

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Specially dedicated to my beloved parent:

Alias Bin Mamat and Kamariah Binti Mohd Ali

To my Supervisor:

Miss Nazreen Binti Waeleh

Also to all my fellow friends who have encouraged and inspired me thanks for all the support and guidance

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ABSTRACT

These days, the precarious climate can be troublesome to individuals to dry their garments outdoors due to unlikely weather condition such as rain. Sometimes, people also often forget to bring in their clothing during rainy days. For working individuals, this would be a matter to look upon as they lack the time to manage their daily chores and routine. Based on these cases, an idea was developed to avoid clothes which are dried outdoors to be exposed to rain. This product can runs automatically by using a microcontroller as the main control system function of the product. Main objective of this project to design rain sensor circuit and LDR circuit using proteus software., To develop a code of controller using Arduino UNO system and to fabricate rain sensor circuit and LDR circuit. All programs in this device was installed using Arduino UNO which will provide instructions to conduct this system properly, thus automatically retrieving-out the clothes on sunny days and retrieving-in the clothes on rainy days. Then to make this system function properly needed a DC gear box motor, LDR and rain sensor as a main function. Besides that, the advantages of this product is that it is energy and time efficient, and is easier for employed individuals indirectly perform chores at home.

ABSTRAK

Perubahan cuaca yang tidak menentu menyebabkan orang ramai susah untuk mengeringkan pakaian mereka di luar kawasan rumah dan menyebabkan mereka lebih risau ketika musim hujan. Kadangkala mereka sering lupa untuk membawa masuk pakaian mereka ketika hari hujan. Bagi individu yang bekerja sudah tentu ini akan menjadi salah satu perkara yang sangat merisaukan untuk menjemur pakaian ketika mereka tiada di rumah, lebih-lebih lagi apabila mereka kekurangan masa untuk menguruskan kerja-kerja dan rutin harian di rumah. Untuk mengatasi masalah ini satu produk di kemukakan bagi mengelakkan pakaian yang di jemur di luar rumah yang terdedah kepada hujan terselamat dari terkena hujan. Produk yang ingin di bangunkan ini berjalan secara automatik dengan menggunakan pengawal mikro sebagai fungsi utama yang akan menggerakkan produk ini. Objektif utama produk ini adalah untuk mereka bentuk litar sensor hujan dan litar LDR dengan menggunakan perisian proteus, dan juga untuk memasukkan kod kawalan ke dalam perisian Arduino UNO supaya arahan yang di masukkan berjalan dengan sistematik. Melalui sistem ini, pakaian yang di jemur akan bergerak masuk secara automatik ketika hari hujan dan akan keluar sendiri pada hari cerah. Untuk membuatkan sistem ini berfungsi dengan baik, DC gearbox motor, pengesan LDR dan pengesan air hujan di perlukan sebagai fungsi utama dalam menjalankan produk ini. Selain itu, kelebihan produk ini adalah ia akan menjimatkan tenaga dan masa dan kerja-kerja harian akan menjadi lebih mudah.

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CHAPTER I

INTRODUCTION

1.0 Background Information

These days, the precarious climate can be troublesome to individuals to dry their garments outdoors due to unlikely weather condition such as rain. Sometimes, people also often forget to lift their clothing during the day rainy days. For people who working, of course they worry about their clothes that have been dried outside. Therefore, people often do not have time to manage their routine. On this cases, some of ideas was create to avoid drying clothes are exposed to rain that can moves forward and backward to avoid clothes from rainy. Then, name of this product developed is „AUTOMATED SMART HANGER" that can run automatically by using microcontroller as a main

function to control component in this product. All programs and coding will be installed to Arduino UNO that will give instructions to conduct this system properly and will automatically retrieve-out the clothes when it is the sunny day and oppositely retrieve-in the clothes when it is a rainy day. In addition, this project uses DC gearbox motor to moves forward and backward so that it can move the clothes to the unexposed area. Besides that, the advantages of this product are, it can save the energy and time of other users to do the job without regard to the clothes that had dried. Moreover, these products make it easier for workers who are not at home. This product will function when raining or dark day. Then rain sensor will function as a connecting circuit. The function of DC gearbox motor in this product is to determine the motor movement rotates left or right. The time appointed will function to make the rainout shelter moves only move in a half cycle. It is intended to change the position of clothes from rain exposure. LDR sensors will be used to detect light. When the weather is dark, clothes will be moving to a place that is not exposed from rain or night.

1.1 Motivation

Unstable weather condition can make difficulty in drying clothes and the situation is worsen if it‟s raining Moreover, Malaysia is located near to the equator line. This make Malaysia is prone to experience rain and damp state over the years However, the climate in South East Asia, where Malaysia is located, is strongly seasonal because of the different monsoons caused by the changes in the direction and speed of airstreams. Malaysia is never excessively hot because Malaysia basically observes by tropical climate. The rainy season reaches out from September to December on the west coast, whereas on the east coast receive rainfall from October to February. As regards East Malaysia, between the months of November to February it gathers overwhelming rains Normal precipitation of mean annual cumulative rain in Malaysia is 2400mm–3200mm. From November to February is the crest month in Malaysia to become monsoon season, however on the west coast, August turns out to be the wettest month. In general, days are

warm and nights are really cool in Malaysia. Furthermore its average climate is continually welcoming.

1.2 Problem statement

Unstable weather condition can make difficulty in drying clothes and the situation is worsen if it‟s raining. Moreover, Malaysia is located near to the equator line. This make Malaysia is prone to experience rain and damp state over the years. For people who are working, surely they worried about their clothes that left dry outside. Then, from a previous project that only can moves forward and backward to avoid clothes from rainy sometimes hang and not user friendly to uses and to fix this problem, it was upgraded by using DC gearbox motor and sensor that more comfortable for user to use. In addition, Cooling fan and light also, helped clothes make drying faster.

1.3 Project Objective

Objectives of this project are:

I. To design rain sensor circuit and LDR circuit using proteus software.
II. To develop a code of controller using Arduino software.
III. To fabricate rain sensor circuit and LDR circuit.

1.4 Scope of Project

This project will focus on clothesline in order to lighten the burden to everyone in laundry issue. Basically, there are some scopes in this project which are to design rain sensor circuit and LDR circuit. This project will function in two condition where first when raining, rain sensor detect water and second when it gets dark LDR detect a light. Then, automated rain shelter hanger was design that can move automatically during rainy day to help everyone when they hang clothes outdoors. LDR sensor use to detect

weather it will automatically retrieve-out the clothes when it is the sunny day and oppositely retrieve-in the clothes when it is a rainy day. The movement of this project is limited around 1meters depends to timer setting and long of suspensions.

1.5 Thesis Outline

This Automated power hanger System final thesis contains of 7 chapters and they are outlined as below:

- Chapter I explains the introduction that includes concept of automatic cloth retriever system. It also outlines objective and scope of "AUTOMATED SMART HANGER".
- Chapter II describes the architecture used and gives a brief of literature review of system board architecture, sensor module, driver circuit module and output module.
- Chapter III discuss on the full methodology of this project. Provides description and discussion on how the design of the hardware of each module in the systems. The module consists of microcontroller board, rain sensor, LDR sensor, DC motor, driver circuit and output devices.
- Chapter IV discusses about the results and discussion explains the architecture of the project that consist the software implementation.
- Chapter V discuss about the conclusion and recommendation further development of the project.
- Bibliography about a journal that will be referred
- Appendix about coding of the project and configuration of the project.

CHAPTER 2

LITERATURE REVIEW

By the venture did by different analysts, there is many a previous project which needed a modified to make some product created more streamlined and successful. It is very important to improve and to develop a successful project. This project also will recommend some future works that could be done to improve the same project. So there are some useful ideas that can be implemented in this project from other similar projects.

2.0 Overview

The first rainout shelter was built in 1962 at Iowa State University (Horton 1962). Early shelters were small in size and required trade-offs between plot size and replication of treatments as well as limiting the size of farm equipment that could be used to apply cultural practices. Since then, several designs have been developed and larger shelters have been built and were reviewed by the first rainout shelter was built in 1962 at Iowa State University (Horton 1962). Early shelters were small in size and required trade-offs between plot size and replication of treatments as well as limiting the size of farm equipment that could be used to apply cultural practices. Since then, several designs have been developed and larger shelters have been built and were reviewed by R.e ries and g.zachmeier Horton (1983) [1]. Design of this rainout shelter considered the variable and sometime severe environmental conditions experienced in the northern Great Plains. This was important since a shelter that would be durable and workable for many years was needed to justify the construction cost [2].

2.1 Previous project

2.1.1 R.e ries and g.zachmeier Horton, automated rainout shelter for controlled water re- searches. “Rainout” shelter for corn. (Iowa farm sci.)845-848. m.l 1983

An automated rainout shelter was constructed for use in conducting controlled water research to gain a better understanding of soil-plant-water relationships. The design and construction criteria were developed to accommodate many components that were commercially available. The primary components are foundation, steel I-beam rail, roller mechanism, rainout shelter structure, drive mechanism, electrical control system, and irrigation system. Wind, temperature, and precipitation sensors activate movement of the shelter to cover a plot area. After inactivation of the sensors and a time delay, the rainout shelter automatically returns to its rest position, ready to repeat its cycle when the sensors are reactivated.

Figure 2.1.1.1: Motor drive unit

Figure 2.1.1.2: Electrical system and weather temperature

2.1.2 Arland D. Schneider, Rainfall Shelters, United States Department of Agriculture (USDA), 227–232, 2003.

Rainfall shelters have been used during the past 50 year to exclude rainfall and other precipitation from research plots and lysimeters. Components of rainfall shelters are site, tracks, shelter structure, drives (mechanism), power supply, and controller.

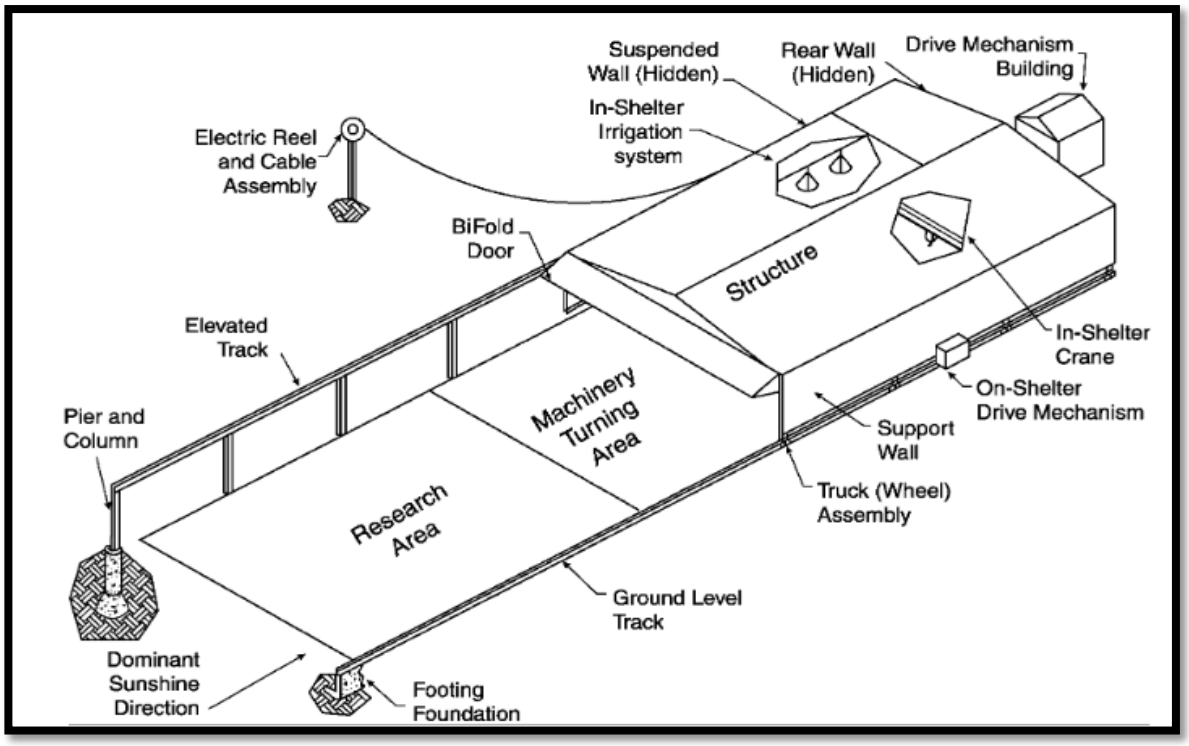

Figure 2.1.2.1: Structure rainfall shelter

Site

The area needs to be well drained. Overall shelter design should allow all or most of the research area to be planted, cultivated, and harvested with nice.

Tracks

Most rainfall shelters have two tracks, but some also have a center track to reduce the structure span or to support a center drive mechanism.

Structure

Structures consist of the framing, covering roof provide design information for minimizing the shading from the second shelter. Maximum width has normally been about 12 meter, but wider spans are possible with heavier structures and tracks.

Drive Mechanism

Rainfall shelter drive mechanisms can be classified by the location and type of the drive. Rain shelter drive mechanisms are of four basic types which are cable and drum, sprocket and chain rack and pinion, and rack drive. The cable and drum mechanism is simply a closed-loop cable passing over a drive drum at the rear end of the shelter and an idler pulley at the opposite end of the tracks. A sprocket and chain drive can use either a closed-loop chain similar to the cable.

Power Supply

Alternating current (a.c.) electricity from a reliable utility grid is the preferred power supply because it allows the use of larger motors and heavier structures solar battery chargers can be used, or charged batteries can be transported to the shelter

Control System

A rain shelter control system consists of a rain sensor for initiating movement of the shelter, controls for starting and stopping motors, and mechanisms for safe operation. Rain shelters have been traditionally controlled with timers, relays, and micro switches that followed some logic sequence to start and stop the drive motors. Programmable controllers are especially well suited to controlling several motors.